

## SUMMARY.

Number of families .....	40
Number of species .....	253

Principal families represented, number of representative species and percentage of naturalised flora.

(1) Graminae .....	52 spp.	20.6%
(2) Papilionaceae .....	51 spp.	20.1%
(3) Compositae .....	33 spp.	13.0%
	136 spp.	53.7%

The number of naturalised plants would be somewhat increased if brought up to date, but the general conclusions drawn here would not be materially affected.

## AGGRESSION IN BIRDS with particular attention to THE AGGRESSION OF MIXED FLOCKS

By ERIC H. SEDGWICK, Caron.

Of recent years students have given much attention to bird behaviour. Much of this attention, however, appears to have been concentrated upon the study of territory and display associated either closely or remotely therewith, while aggression—a marked phase of bird behaviour—seems to have received little attention except in respect of the defence of territory. I would suggest, then, that aggression is a relatively simple type of behaviour, the study of which might possibly throw light on the more complex problems of territory and display.

Aggression among birds appears to be divisible into two classes, not always clearly defined, which might be termed *genuine aggression* and *display aggression*. The former type is well exemplified by the easily provoked attacks of Magpies. These attacks are usually silent, determined and carried out with intent to inflict damage, as most Australian bird observers have learned at the cost of minor scalp injuries. The aggressive display of the Banded Plover falls into the second category. Alarming as these attacks are, they are never, to the best of my knowledge, pressed home and may therefore be summarised as noisy and effective bluff.

A second possible classification of aggressive behaviour is into *individual aggression* and *mass aggression*, the former being the reaction of one or two birds to a situation clearly discernible, while the latter is the reaction of a flock primarily to a situation, but also, secondarily, to the alarm cries and behaviour of the rest of the flock. "Mass aggression" can again be subdivided into the *specific aggression* of unmixed flocks and the *mixed aggression* of flocks made up of two or more species.

Specific mass aggression appears to be comparable with the other social activities such as the foraging of flocks of cormorants

and of pelicans, the breeding in heronries of herons and egrets, and the social displays of waders. As the biological value of mass aggression appears fairly obvious, the phenomenon does not impress one as being very extraordinary.

The aggression of mixed flocks, on the other hand, is more striking. It is true that certain other mixed associations may be comparable, e.g. the mixed feeding associations of Black Duck and Coot, Little Black Cormorant and Australian Pelican and of Mute Swan (*Cygnus olor*) and Hoary-headed Grebe and the associations of species of very similar habits, e.g. White-browed Wood-swallow and Masked Wood-swallow, of Musk Lorikeet and Purple-crowned Lorikeet, or Little Lorikeet, and, last but not least, comparison can be made with the less easily explained mixed flocks of small birds which, through feeding, appear to be associated mainly for the satisfaction of calling excitedly together. These comparisons do not, however, explain what induces birds of two or three, and in some cases even more, species to unite for purposes of aggression. It seems possible that this congregation is a response to a generalised type of call—a primitive call, older than the species, older than the genus—part of a common language of birds.

It is probably no exaggeration to say that the human ear can often recognise the emotion underlying calls of pain, fear and anger uttered by creatures far below him in the scale of animal relationship. In a somewhat similar way, it would seem that certain birds are emotionally responsive to the anger calls of totally unrelated species. This response to a generalised call may be compared with recorded cases of birds feeding the young of other members of their own or of other species or with the response of many small birds, e.g. *Malurus* (spp.) and *Sericornis* (spp.) to "calling up" by an observer.

From our present knowledge of bird-behaviour it does not appear likely that these responses are intelligent—cases of rational mutual aid. That such responses are not entirely intelligent is, perhaps, illustrated by an amusing incident observed by myself. Pausing by a clump of *Callitris* near Miles, Queensland, I was, at once "mobbed" by a party of Apostle-birds. Almost immediately a small party of Noisy Miners arrived and began to abuse both myself and the Apostle-birds indifferently. It seems possible that at least one of the Miners entirely failed to observe my presence.

Curiosity is another factor that may operate in attracting birds to a mobbing—I always endeavour to attend mobbings myself!

A few cases of aggressive behaviour of mixed flocks are detailed in the following table in which, as throughout this paper, the vernacular names are those used in the R.A.O.U.'s "The Official

Cheek List of the Birds of Australia," 1926, where the relevant scientific names may be referred to:—

Date	Locality	Object of Attack	Attackers
Oct. 15, 1944	Fountain Head, N.T.	Koel (female)	Silver-crowned Friar-birds, Little Friar-birds, Yellow-throated Miners and two Blue-faced Honeyeaters.
Jan. 7, 1945	Batchelor, N.T.	Blue-winged Kookaburra (male)	Shining Flycatcher (male) and two Crimson Finches (male and female).
July 17, 1944	Katherine, N.T.	Brown Hawk	Large party of Galahs and two White Cockatoos.
June 4, 1944	Warlock Ponds, N.T.	Rufous Owl	Numerous birds of other species, including Blue-faced Honeyeaters and Blue-winged Kookaburras.
Dec. 25, 1942	Belgrave, Vic.	Tiger Snake	White-browed Scrubwrens, Southern Yellow Robins and a Honeyeater (sp.).
Sept. 30, 1945	Kowguran, Qld.	Observer	c.9 Apostle-birds, Noisy Miners, Magpie-larks (two) and a White-winged Chough.
Oct. 3 1945	Kowguran, Qld.	Observer	c.7 Apostle-birds and Noisy Miners.
May 20, 1935	Nangeenan, W.A.	Boobook Owl	A number of Red Wattlebirds and two Grey Butcher-birds.
Feb. 1, 1935	Nangeenan, W.A.	Tawny Frogmouth	Two Magpie-larks, a Butcher-bird and several Western Magpies.
Feb. 3, 1935	Nangeenan, W.A.	Boobook Owl	Several Dusky Miners and a Grey Butcher-bird.
April 15, 1936	Nangeenan, W.A.	Raven	Western Magpie and a number of Dusky Miners.
Mar. 5, 1941	Peel Estate, W.A.	Carpet Snake	Dusky Miners and Grey Butcher-birds.
Mar. 3, 1935	Nangeenan, W.A.	Brown Hawk	Western Magpies and Magpie-larks.
June 8, 1938	Peel Estate, W.A.	Toy Teddy Bear	Western Magpies, Magpie-larks, Dusky Miners and one Grey Butcher-bird.

## FROM FIELD AND STUDY

**Length of Kangaroo's Leap.**—Some information is to hand on the length of jump of a Kangaroo (*Macropus ocydromus*). Mr. Edgar Grant, of Narrogin, measured one on the flat and it was 44 feet 9 inches, a tape measure being used. This is very interesting and it is worth quoting E. Le G. Troughton on this matter. He says ("Furred Animals of Australia"): "Leaps of up to nearly forty feet have been reported, but such records, if true, would undoubtedly have been influenced by unusually favourable circumstances of take-off and sloping ground." So this jump is really in the record class.

—V. N. SERVENTY, Subiaco.

**Flight Speed of Bronzewing Pigeons.**—It is well known that interesting data on the speed of bird flight can be obtained